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GOOD PRACTICES RECOMMENDATION

Prevention, diagnosis and management of empty nose syndrome*

Original French Document and Supporting Material Available at: https://www.has-sante.fr/jcms/p_3395700/fr/prevention-diagnostic-et-prise-en-charge-du-syndrome-du-nez-vide?fbclid=IwAR2dRRNDGKD_aZfVDklPBxTBy7wSstgnKhuqzPhsu-bcZekNIa6EH5c0b9M

Validated by the College on November 17, 2022

Good practice recommendations (GPR) are defined in the field of health as proposals developed methodically to help the practitioner and the patient seek the most appropriate care in given clinical circumstances.

GPRs are rigorous summaries of the state of the art and scientific data at a given time, described in the scientific argument. They cannot exempt the healthcare professional from exercising discretion in their care of the patient, which must be that which they consider most appropriate, based on their own findings and the patient's preferences.

This good practice recommendation was developed according to the method summarized in the scientific argument and described in the HAS methodological guide available on its website: Development of good practice recommendations – Method Recommendations for clinical practice.
The objectives of this recommendation, the population and the professionals concerned by its implementation are briefly presented on the last page (descriptive sheet) and detailed in the scientific argument.
The latter as well as the summary of the recommendation can be downloaded from www.has-sante.fr.

Grade of recommendations

A	**Scientific proof established** Based on studies with a high level of evidence (level of evidence 1): high-powered randomized controlled trials without major bias or meta-analysis of randomized controlled trials, decision analysis based on well-conducted studies.
B	**Scientific presumption** Based on scientific presumption provided by studies of intermediate level of evidence (level of evidence 2), such as underpowered randomized controlled trials, well-conducted non-randomized comparative studies, cohort studies.
C	**Low level of evidence** Based on studies with a lower level of evidence, such as case-control studies (level of evidence 3), retrospective studies, case series, comparative studies with significant bias (level of evidence 4).
EA	**Expert agreement** In the absence of studies, the recommendations are based on an agreement between experts in the working group, after consultation with the reading group. The absence of gradation does not mean that the recommendations are not relevant and useful. It must, however, encourage the undertaking of additional studies.

Description of the publication

Title	Prevention, diagnosis and management of empty nose syndrome
Method of working	Recommendation for clinical practice.
Objectives	Prevent empty nose syndrome (ENS) Diagnose and manage patients who develop ENS
Targets	Patients who are offered turbinate surgery. Patients who have undergone such surgery and developed ENS Professionals carrying out such surgical interventions and more broadly all those involved in the prevention, diagnosis, monitoring and management of patients with ENS
Applicant	Empty Nose Syndrome Association France and French Federation of Associations and Friends of the Sick, Respiratory Impaired or Disabled.
Promoter(s)	High Health Authority (HAS).
Project management	Coordination: Cédric Paindavoine, project manager, HAS good practices department (department head: Doctor Pierre Gabach). Secretariat: Ms. Jessica Layouni.
Literature search	From January 2000 to May 2022 (see documentary research strategy described in appendix 1 of the scientific argument). Produced by Ms. Marie Georget, with the help of Ms. Yasmine Lombry and Ms. Juliette Chazareng (head of the documentation – monitoring service: Ms. Frédérique Pagès).
Authors	Dr Julie Fernandez Rodriguez, otolaryngologist and head and neck surgeon, Marseille – project manager.
Conflicts of interest	The members of the working group communicated their public declarations of interests to HAS. They can be viewed on the site https://dpi.sante.gouv.fr . They were analyzed according to the analysis grid of the HAS guide to declarations of interest and management of conflicts of interest. The interests declared by the members of the working group were considered to be compatible with their participation in this work.
Validation	Version of November 17, 2022
Update	Updating the recommendation will be considered based on data published in the scientific literature or significant changes in practice that have occurred since its publication.
Other formats	Scientific argument, decision tree and information sheet for patients downloadable from www.has-sante.fr

This document as well as its bibliographical reference can be downloaded from www.has-sante.fr

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Key messages

The following recommendations were considered to be those to be implemented as a priority to improve the quality of care delivered to patients at the time of publication of the good practice recommendation.

- **Preventive actions are essential in order to minimize the risk of occurrence of ENS.**
- **The occurrence of a ENS is always the consequence of a lower or middle turbinal procedure. It is reasonable to link the ENS primarily to procedures on the inferior turbinates and the importance of turbinal reduction (grade C).**
- **It is important to differentiate ENS from atrophic rhinitis which may present the same nasal symptoms but which occurs outside of any context of turbinate reduction or endonasal surgical procedure (EA).**
- **When they are intended to correct a functional obstructive disorder, it is recommended to prohibit large lower turbinectomies which are at greatest risk of occurrence of ENS. In this indication, it is recommended to preserve at least 2/3 of the turbinal structure (EA)**
- **When faced with chronic nasal obstruction, it is recommended to look for an inflammatory, tumoral, pseudo-tumoral or infectious cause which would require specific treatment, then to look for the architectural, mucosal or mixed origin of the chronic nasal obstruction (EA).**
- **If a septoplasty or rhino-septoplasty is performed to correct chronic nasal obstruction of purely architectural origin, it is recommended not to perform an associated lower turbinal procedure as first intention (EA).**
- **In the event of a suspected mucosal or mixed origin, the etiology, particularly allergic, must be sought using appropriate means (diagnosis of rhinitis, diagnosis of allergy). It is recommended to always start with medical treatment adapted to the etiology and to wait at least three months before evaluating its effectiveness (EA).**
- **If there is a remarkable discrepancy between the intensity of the obstruction felt by the patient and the results of the assessment, in particular instrumental tests, it is recommended to seek psychiatric advice to look for a possible functional somatic disorder before any new surgical decision. (EA).**
- **The diagnosis of a ENS is based on questioning (looking for a history of turbinal gesture, paradoxical nasal obstruction and other nasal and extranasal symptoms classically associated with this entity), as well as on clinical examination and endoscopic of the nose.**

- **The improvement in the symptoms felt by the patient with the wet cotton test (artificial limitation of the nasal air passage by a partially obstructive vestibular cotton placed in different sites) is a complementary argument in favor of the diagnosis of ENS. It is recommended to carry out the damp cotton test (grade C).**

- **In all cases, before any turbinal procedure, the patient must be formally informed about the risk of occurrence of ENS.**

- **It is recommended to favor techniques with the least risk of occurrence of a ENS retaining at least 2/3 of the turbinal structure (EA).**

- **It is recommended to always begin the treatment of ENS with medical treatment (EA).**

- **When prolonged medical treatment (> 6 months) is insufficient to correct the symptoms and reduce the impact of ENS on the patient's quality of life, surgical treatment aimed at restoring resistance to the passage of air and improving flow nasal air can be discussed (EA).**

- **In all cases, given the frequency of anxiety-depressive disorders and their links with the intensity of ENS symptoms, multidisciplinary care including psychiatric care is recommended (EA).**

- **It seems important to propose the establishment of a national ENS register allowing the most exhaustive collection of data possible for real-life analysis.**

Preamble

This good practice recommendation is part of the care pathway for patients with chronic nasal obstruction or who have developed ENS after a turbinal procedure. It is part of a multidisciplinary consultation (associating ENT, general practitioner and any other necessary professional: psychiatrist, pulmonologist, speech therapist, physiotherapist, etc.) and a decision shared with the duly informed patient.

Referral

The French Empty Nose Syndrome Association sent a referral to the HAS relating to the syndrome of the same name, relayed by the French Federation of Associations and Friendlies of the Sick, Respiratory Impaired or Disabled (FFAAIR).

Among the numerous requests made in this referral, which do not all fall within the missions of the HAS, is the “scientific evaluation of the indications for the turbinate ablation and/or reduction technique, the determinants of empty nose syndrome and currently available treatments for VNS.

The HAS included in its work program the development of a good practice recommendation and invited the applicant and the National Professional Council of Otorhinolaryngology and Head and Neck Surgery in order to delineate the theme. These stakeholders, in concert, retained the title: “Prevention, diagnosis and management of empty nose syndrome in the event of surgical intervention for nasal obstruction”.

The working group subsequently wanted to change the title, which then became “Prevention, diagnosis and management of empty nose syndrome”.

Context

Empty nose syndrome (ENS) is a complication of turbinal reduction surgery performed as a last intention in cases of nasal obstruction, allergic rhinitis, etc. In practice, it is a procession of nasal and extranasal symptoms (and not a disease) occurring within a variable period (days to years) after turbinal surgery.

In the absence of a reliable epidemiological study, the incidence is poorly known.

On the physiopathological level, ENS results in sensations of paradoxical nasal obstruction, loss of humidification functions and warming of the inspired air; loss of sensory receptors but retained menthol sensitivity; increase and modification of air flow speed; disturbances in ventilatory control; neuropsychological factors.

ENS also results in extranasal signs: dyspnea/hyperventilation; headaches; fatigue/difficulty concentrating; sleeping troubles ; anxiety/mood disorders.

ENS can have psychological repercussions: depression, major desocialization, agoraphobia, job loss and sometimes even damage to physical integrity.

Questions come up regularly and remain unanswered:

- Why do some patients who have undergone total ablation of the inferior turbinates for a tumor pathology not develop ENV?
- Could simple cauterization of the inferior turbinates (the least invasive procedure possible) cause ENS in certain patients?
- Why has ENS been described for 15-20 years while turbinate surgery is much older?

There is a lack of knowledge and recognition on the subject, and the impact on the quality of life of the patients concerned is major, but progress exists (study on dyspnea invoking hyperventilation, work on the flow of fluids through a team from Marseille, etc.).

In any case, the emphasis must be placed on informing the patient.

Goals

This good practice recommendation aims on the one hand to prevent ENS, and on the other hand to diagnose and manage patients who develop ENS.

The aim is to improve the care of patients and therefore the quality and safety of the care provided to them, as well as their quality of life, by helping decision-making in the choice of care and by enabling the professionals concerned to improve and harmonize their practices.

Targets Concerned

This good practice recommendation concerns patients who are offered turbinate surgery, as well as those who have developed ENS after undergoing such surgery.

This good practice recommendation is intended for professionals carrying out such surgical interventions likely to be the cause of ENS and more broadly for all those involved in the prevention, diagnosis, monitoring and management of patients affected with ENS

1. General

1.1. Definition

There is no consensus definition of ENS. However, it must be identified and for this the working group proposes the following definition.

ENS is an iatrogenic condition which is characterized by the appearance of a procession of nasal symptoms, associated with an extranasal impact, occurring more or less shortly after a reduction procedure mainly of the lower, but also middle, turbinates, carried out in isolation. or associated with other procedures on the nasal structures (nasal septum, sinuses, nasal pyramid and valve) (AE).

It should be differentiated from atrophic rhinitis which may present the same nasal symptoms but which occurs outside of any context of turbinate reduction or endonasal surgical procedure (EA).

1.2. Incidence

The incidence of ENS after turbinate surgery remains largely unknown. There is no epidemiological study to rely on.

1.3. Time of occurrence

It is not possible, within the limits of current knowledge, to define an interval of occurrence between the performance of a procedure on the turbinates and the appearance of ENS

Nevertheless, taking into account the healing times of the nasal tissues, taking into account the physiopathological mechanisms considered below, it is reasonable to estimate that ENS has no reason (except for a new nasal procedure or remarkable change in environment) to occur beyond two years after a turbinal procedure (EA).

2. Pathophysiology

2.1. Pathophysiological mechanisms of ENS: hypotheses

The pathophysiological mechanisms of ENS are complex and probably multiple. They are not yet clearly elucidated.

The turbinates, especially the lower turbinates, have a major role in nasal respiratory functions, warming and humidifying the inspired air, and providing a barrier against airborne contaminants. They are also involved in the control of breathing and the feeling of nasal respiratory comfort.

Nitric oxide (NO) secreted in the sinuses is carried, via nasal breathing, to the lungs and allows adaptation of the vascularization in order to optimize gas exchanges. It could also have antiviral and antibacterial action.

Pathologies affecting the turbinates, especially the lower ones, can alter these different functions and be particularly responsible for nasal obstruction.

Instrumental procedures and surgical procedures on the turbinates, primarily inferior, used to respond to a problem of chronic nasal obstruction, can also lead to alterations in the functions of the turbinates contributing to the development of ENS and explaining in particular its symptom. more common, paradoxical nasal obstruction.

The paradoxical qualification is due to the fact that a turbinal reduction was carried out to correct an obstruction, and while this reduction enlarges the diameter of the nasal passage for the passage of the air flow, the patient feels an obstruction which would mechanically no longer have any reason to be affected or should be affected to a lesser extent.

Data that deserves to be confirmed suggests that anatomical-functional links exist between the nerve centers and the receptors of the nasal mucosa. The co-existence of hyperventilation with ENS and the symptomatic improvement with rehabilitation point in this direction.

2.2. Etiologies of ENS

By definition, the occurrence of a ENS is always the consequence of a lower or middle turbinal procedure. It is reasonable to link ENV first and foremost:

- to gestures on the lower turbinates;
- and the importance of turbinal reduction (grade C).

When they are intended to correct a functional obstructive disorder, it is recommended to prohibit large lower turbinectomies which are at greatest risk of occurrence of ENS. In this indication, it is recommended to preserve at least 2/3 of the turbinal structure (AE).

2.3. Facilitating factors

Apart from the surgical triggering factor, there is no contributing factor identified to date in the literature.

3. Prevention

Preventive actions are essential in order to minimize the risk of occurrence of ENS.

Faced with chronic nasal obstruction, it is recommended to perform a nasal endoscopy, if necessary supplemented by a CT scan, to look for an inflammatory, tumoral, pseudo-tumoral or infectious cause which would require specific treatment (EA).

It is then recommended to look for the architectural, mucosal or mixed origin of chronic nasal obstruction based on:

- the characteristics of the obstruction;
- and the findings of the clinical examination (possibly supplemented by a clinical test with local vasoconstrictors in the absence of contraindication) (EA).

The results of an instrumental nasal exploration (rhinomanometry which studies the pressure/flow relationship of the air flow and/or acoustic rhinometry which studies the internal geometry of the nasal cavities) with provocation tests with vasoconstrictors (in the absence of contraindication) can be very useful in the characterization of chronic nasal obstruction and in the therapeutic decision (EA).

If a septoplasty or rhino-septoplasty is performed to correct chronic nasal obstruction of purely architectural origin, it is recommended not to perform an associated lower turbinal procedure as first intention (EA).

In the event of a suspected mucosal or mixed origin, the etiology, particularly allergic, must be sought using appropriate means (diagnosis of rhinitis, diagnosis of allergy). It is recommended to always start with medical treatment adapted to the etiology and to wait at least three months before evaluating its effectiveness (EA).

In the event of symptomatic failure of medical treatment, after verification of treatment compliance and new clinical examination, if there is a remarkable discrepancy between the intensity of the obstruction felt by the patient and the clinical examination , it is recommended to perform a CT scan and nasal instrumental exploration (rhinomanometry and/or acoustic rhinometry) with vasoconstrictor provocation tests (in the absence of contraindication) if they have not been performed beforehand (EA) .

If nasal instrumental exploration (rhinomanometry and/or acoustic rhinometry) with vasoconstrictor provocation tests (in the absence of contraindication) confirms this discordance, it is recommended to look for a possible functional somatic disorder before any surgical decision (EA).

If there is no remarkable discrepancy between the intensity of the obstruction felt by the patient and the clinical examination, a turbinal reduction procedure may be proposed. It is recommended to favor techniques with the least risk of occurrence of SNV, retaining at least 2/3 of the turbinal structure (EA).

In the event of symptomatic failure of this turbinal procedure, it is recommended to carry out a new clinical assessment, including imaging and instrumental tests (rhinomanometry and/or acoustic rhinometry) with vasoconstrictor provocation tests (in the absence of contraindications). indication) before any decision for more invasive turbinal surgery (EA)

If there is a remarkable discrepancy between the intensity of the obstruction felt by the patient and the results of the assessment, in particular instrumental tests, it is recommended to seek an opinion psychiatric to look for a possible functional somatic disorder before any new surgical decision (EA).

In all cases, before any turbinate procedure, the patient must be formally informed about the risk of occurrence of ENS

In addition to information on the risk linked to the intervention, and distinctly from this information, a decision aid can be useful to enable patients to choose an intervention, if necessary. HAS has also published elements to enable stakeholders to develop such shared decision aids between patient and healthcare professiona

4. Diagnosis

The diagnosis of a ENS is based on an examination looking for a history of turbinal gesture, paradoxical nasal obstruction and other nasal symptoms (dryness, crusts, hypersensitivity to various stimuli, pain, posterior rhinorrhea, disturbance of the sense of smell) and extranasal (dyspnea, sleep disorders, attention disorders, anxiety disorders, depressive disorders, headaches, pharyngeal dryness) classically associated in this entity.

Clinical and endoscopic examination of the nose is essential; it must focus on assessing the turbinate volume and vasoreactivity that may persist, and look for other mucosal and architectural abnormalities.

The improvement in the symptoms felt by the patient with the wet cotton test (artificial limitation of the nasal air passage by a partially obstructive moistened cotton placed in different sites) is a complementary argument in favor of the diagnosis of ENS. It is recommended to carry out the damp cotton test (grade C).

Imaging is recommended allowing the assessment of the residual turbinal volume on a shareable document and possibly allowing comparison with pre-existing imaging of the turbinal procedure if it exists (EA).

Rhinomanometry, rather than acoustic rhinometry, is recommended to objectively eliminate potential persistent nasal obstruction (EA).

In all cases, it is recommended to evaluate the impact of the symptoms on the patient's quality of life (possibly by self-administered SNOT-22 questionnaire) and to assess their impact in terms of family, social and professional life (EA)

In the event of suspicion of anxio-depressive syndrome and/or a remarkable discrepancy between the symptoms, the findings of the assessment and the impact on the patient's quality of life which may suggest a functional somatic disorder, it is recommended to refer the patient for a psychiatric opinion (EA).

5. Treatment

The management of ENS is not yet consensual in the literature. However, it is recommended:

- to establish the diagnosis using appropriate means, its recognition being an important step in patient care (EA);
- to look for a hyperventilation syndrome (dyspnea and ventilatory changes unrelated to a hematosis disorder or an organic abnormality of ventilatory regulation) and to propose rehabilitation based on the results of the respiratory tests (grade C);
- always start with medical treatment (EA);
- to look for a possible functional somatic disorder and/or an associated anxiety-depressive syndrome for specialized care (EA).

For medical treatment, depending on the patient's tolerance and the effectiveness felt, it is recommended to combine nasal cavity washings (salt serum, sulfur derivatives) with means of nasal humidification (moisturizing gel and ointment, humidifier aerosol) while limiting the frequency of their use to prevent the risk of reinforcing mechanisms and paradoxical aggravation of disorders. In the event of local signs of infection, the use of antibiotics (oral, local) is possible in the absence of contraindication. In the event of local signs of inflammation, the use of local corticosteroids is possible in the absence of contraindication (AE).

The use of menthol inhalation, which can provide a feeling of nasal respiratory comfort, is also recommended if it is well tolerated (grade C).

When prolonged medical treatment (> 6 months) is insufficient to correct the symptoms and reduce the impact of ENS on the patient's quality of life, surgical treatment aimed at restoring resistance to the passage of air and improving flow nasal air can be discussed. It is recommended to fuel this discussion with (EA):

- a complete assessment (clinical examination, CT scan, instrumental tests, wet cotton test);
- a psychiatric evaluation.

In the absence of studies with a high level of evidence, one technique cannot be recommended over another, nor one filling material over another (EA).

If surgical treatment is considered, it is necessary to clearly inform the patient about the technique and material used, the perioperative constraints inherent to anesthesia and surgery, as well as the significant and difficult risk of failure. predictable.

In all cases, given the frequency of anxiety-depressive disorders and their links with the intensity of ENS symptoms, multidisciplinary care including psychiatric care is recommended (AE).

6. Outlook

6.1. Progress in diagnosis, epidemiology and management

As highlighted on several occasions, information is lacking in a number of areas concerning ENS, both on its epidemiological aspects, its post-intervention onset times, the typology of actions triggering ENS, the frequency of the different symptoms, the socio-familial/professional impact. and psychiatric, the explorations carried out and the treatments implemented and their effectiveness.

Validation of the French translation of the ENS6Q score would provide a more specific tool for assessing the quality of life of patients with ENS
It seems important to propose the establishment of a national ENS registry allowing the most exhaustive possible collection of this data for a real-life analysis of the practice of the different healthcare providers required to care for patients with ENS

6.2. Exploring sleep disorders during VNS

Sleep disturbances are almost constant in ENS, but they have not been characterized. Their origin is certainly multifactorial: nasal dysfunction (discomfort falling asleep and nocturnal awakenings), ventilatory disorders (sleep apnea, high resistance syndrome of the upper airways), anxiety and depressive disorders. It seems important to propose a prospective study of the sleep of these patients using polysomnography, specific validated questionnaires and a sleep diary, which will make it possible to better characterize these sleep disorders and their different components, to provide appropriate support.

6.3. Develop global care approaches

It appears from the analysis of the literature and the experience of the caregivers involved in this good practice recommendation that ENS is more or less frequently accompanied by daytime (and perhaps nocturnal) ventilatory disorders. Post-surgical reduction in nasal resistance and disturbances in the collection of signals normally picked up at the nasal mucosa (increase in airflow speed, reduction in sensitive sensors in the nasal mucosa, lack of humidification and thermoregulation of the flow air, decreased nasal NO production) are most likely involved in ventilation control dysfunctions (the frequent association of VNS with hyperventilation syndrome would be a good example).

It would be interesting to explore these ventilatory disorders further and at the same time develop methods:

- speech therapy rehabilitation and/or oro-myofacial physiotherapy by analogy with what exists in “mouth breathers” patients;
- specific respiratory rehabilitation perhaps inspired by methods developed in hyperventilation syndrome.

It would also be interesting to explore the mechanisms of pain when it is present in these patients (algologist, neurologist, pain center and multidisciplinary care).

In all cases, complementary therapy approaches could be useful but remain to be evaluated (sophrology, osteopathy, acupuncture, etc.).

6.4. Develop minimally invasive methods to reduce airflow

In the vast majority of cases, it is the excessive resection of part of the turbinates which involves the development of ENS. The excess passage of air flow at the nasal level with reduction of turbulence and acceleration of speeds helps to explain the development of nasal symptoms (paradoxical obstruction, dryness, pain particularly with cold air, posterior rhinorrhea, etc.) and is probably involved in certain extra-ENT disorders (dyspnea, hyperventilation, etc.).

Moreover, many authors suggest carrying out a wet cotton test aimed at partially obstructing the nasal passages by looking for symptomatic improvement subjectively perceived by the patient.

Some teams are working, using digital simulation of fluid flow, on a personalized approach aimed at virtually recreating the right possible obstacle to air flow and then being able to propose it surgically. These still experimental approaches will not be able to become clinical routine for several years.
It seems important to develop minimally invasive approaches aimed at limiting nasal airflow. The development of potentially humidifying nasal vestibular filters by manufacturers seems interesting even if their permanent use is unlikely. Intranasal injection into well-selected anatomical sites of resorbable compounds (eg: hyaluronic acid, autologous fat) could improve symptoms and quality of life but needs to be evaluated. The possible improvement thus obtained in a patient could also be predictive of a good result of surgical implantation of non-resorbable materials. Finally, in the future, the development of tissue reengineering techniques will perhaps make it possible to approach turbinate “reconstruction”.

6.5. De-dramatize and democratize the psychiatric part of care

The impact of ENS on family, social and professional life is often major and goes beyond the simple framework of associated symptoms and disorders. Patients with ENS more easily develop an anxiety-depressive disorder and/or a functional somatic disorder which are the main contributors to this impact. Organ specialists, especially ENT specialists, caring for patients are often unable (due to lack of skills) to diagnose these disorders and help patients overcome them. It seems essential that patients with ENS can consult a psychiatrist who will be able to establish the correct diagnosis and guide treatment. This is not a question of “psychiatrizing” the VNS, as feared by some patients.

For greater efficiency, exchanges of information and training actions appear important. It seems necessary that organ specialists learn to master some keys to clinical screening of anxiety-depressive disorders and functional somatic disorders and thus be able to offer patients a

consultation with a psychiatrist. Conversely, it is also important that psychiatrists receive more information regarding VENS and its clinical particularities

Attendees

The following professional organizations and patient and user associations were asked to propose experts invited individually to the working/reading groups:

Empty nose syndrome association France*

College of General Medicine

French speech therapy college*

National College for the Quality of Psychiatric

Care National Professional Council of Internists

National Professional Neurology Council

National Professional Council of Otolaryngology and Head and Neck Surgery*

National professional pulmonology council*

National Professional Council of Psychiatry

French Federation of Psychiatry*

French Federation of Associations and Friends of the Sick, Insufficient or Respiratory Disabled*

French Federation of Psychologists and Psychology* French-speaking clinical neurophysiology society Physiology Society

French society for the study and treatment of pain

French Society for Research and Sleep Medicine

(*) This organization has proposed one or more experts for this project.

Work group

Professor André Coste, otolaryngologist and head and neck surgeon, Créteil – president of the working group

Dr Julie Fernandez Rodriguez, otolaryngologist and head and neck surgeon, Marseille – project manager

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Mr. Didier Lerond, speech therapist, Woippy

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Thanks

HAS would like to thank all of the participants listed above.

Abbreviations and acronyms

ENS6Q	***Empty Nose Syndrome 6-item Questionnaire***
HAS	**High Authority of Health**
NO	**Nitric oxide**
ENT	**Otolaryngology/otolaryngologist**
SNOT-22	***Sino-Nasal Outcome Test-22***
SNV	**Empty nose syndrome**